

AB2

(ii) a second type of said draining layers includes said sealing elements disposed at a side thereof adjacent said filtrate space, and said flow elements disposed at an opposite side thereof adjacent said unfiltered material space, wherein said filter regions and said first and second types of draining layers are formed into a stack on one another without gaps, such that said first and second types of draining layers alternate relative to one another in said stack so that said sealing elements thereof alternately seal the draining layers from said filtrate and unfiltered material spaces, and said flow elements alternately establish flow paths between said draining layers and said filtrate and unfiltered material spaces, respectively, and wherein said flow elements of said first and second types of draining layers include openings which allow fluid flow between said filtrate and unfiltered material spaces, respectively, and said draining layer material.

24. (NEW) Filter module as claimed in claim 23, wherein said openings include holes formed through said flow elements.

25. (NEW) Filter module as claimed in claim 23, wherein said openings include grooves formed in said flow elements.

26. (NEW) Filter module as claimed in claim 24 or 25, wherein at least one of said sealing elements and flow elements include connectors for establishing mutual connection between the filter regions and the draining layers in the stack.

REMARKS

Favorable reconsideration and allowance of this application are requested.

At the outset, the Examiner's attention is directed to the accompanying form PTO-1449 which lists those publications cited in the original specification and not

already of record herein. A copy of each such listed publication is also attached. consideration of the publications listed on the accompanying form PTO-1449 is therefore requested, for which purpose the fee required by Rule 97(c) is attached.

By way of the amendment instructions above, many of the claims originally pending herein have been amended so as to address the Examiner's rejections advanced under 35 USC §112, second paragraph. Accordingly, the issues raised by the Examiner under this statutory provision are believed to have been addressed completely.

Claims 15-26 have been added for consideration, while claim 6 has been cancelled. In this regard, it will be observed that the claims now pending herein recite that the filter modules of the invention include a "filter region" which may be comprised of an individual filter layer (e.g., as shown in Figure 1) or may be comprised of a plurality of filter layers (e.g., as shown in Figure 4). Corresponding conforming language changes have thus been made to the specification.

New Claim 23 is in independent form and is substantively similar to the amended version of claim 1 with the principal difference being that the former does not necessarily require the presence of the connectors. However, claim 23 does require that the flow elements include openings for fluid flow. Claims 24 and 25 emphasize that the openings include holes or grooves, while claim 26 (multiply dependent from claim 24 or 25) recites the presence of the connectors.

Thus, claims 1-5, and 7-26 are now pending herein for which favorable reconsideration on the merits is awaited.

Original claims 1, 3-4, 6-12 and 14 attracted a rejection under 35 USC §102(b) as allegedly being anticipated by Naruo et al (USP 4,871,456), while claims 2 and 7 where rejected as allegedly being "obvious", and hence unpatentable, under 35 USC §103(a) from Naruo et al (USP 4,876,007). Raifman (USP 5,112,503) has been combined with Naruo et al '007 to reject claims 5 and 13 under 35 USC §103(a).

Applicants suggest that none of the applied patents is appropriate as a reference against the claims now pending herein.

Specifically, applicants note that the filter module in accordance with the present invention includes draining layers which are disposed so as to establish flow paths *alternately* between the draining layer material and the unfiltered material space and the filtrate space, respectively. Neither of the applied Naruo et al references (i.e., both Naruo et al '456 and Naruo et al '007) teach or suggest such *alternately* disposed draining layers as employed in the practice of the present invention.

Applicants also note that one aspect of the present invention is that sealing is effected by clamping of the layers. This clamping is realized by means of mutual connection which are part of the flow elements and/or sealing elements. Thus, according to the present invention, it is possible to provide such connection means at the outer periphery of the filter module.

No equivalent clamping means can be found in the Naruo et al references. However, applicants note the Examiner is mistaken if she is reading core 4 as being structurally comparable to the connectors of the present invention. One benefit of the applicants' filter module is the fact that such a core or center tube can be omitted precisely for the reason that the connectors at the outer periphery stabilize the entire filter module.

Hence, structurally and functionally the present invention is both novel and unobvious from the applied Naruo et al references.

The applied Raifman reference fails to cure the deficiencies of Naruo et al '456 and/or Naruo et al '007. Thus, its combination with Naruo et al '007 to reject claims 5 and 13 is likewise inappropriate.

Every effort has been made to advance prosecution of this application to allowance. Hence, in view of the amendments and remarks above, applicants suggest

STROHM et al.

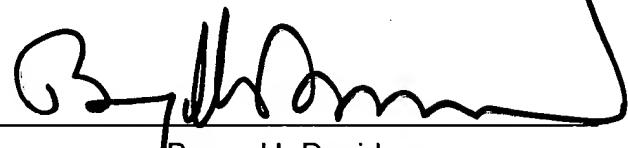
Serial No. 09/744,159

that this application is in condition for allowance and Official Notice to that effect is solicited.

An early and favorable reply on the merits is awaited.

Respectfully submitted,

NIXON & VANDERHYE P.C.

By: 

Bryan H. Davidson
Reg. No. 30,251

BHD:fmh

1100 North Glebe Road, 8th Floor
Arlington, VA 22201-4714
Telephone: (703) 816-4000
Facsimile: (703) 816-4100

APPENDIX I

Marked-Up Version of Specification Paragraph(s) Pursuant to 37 CFR §1.121(b)

Please change the paragraph on page 7, lines 4-13 to read as follows:

Figure 1 shows a vertical section through a filter module 4. The filter module [consists of] include filter regions formed of individual filter layers 1 which alternate with draining layers 5. For the geometry of the filter layers 1 and the draining layers 5 for example a round shape can be chosen, as proceeds from Figures 2 a - c. The filter module 4 is surrounded by the space 2 for the unfiltered material and in the center has a filtrate space 3 in the form of a channel. Accordingly both the filter layers 1 and also the draining layers 5 have a central hole. The flow direction of the filtrate and the unfiltered material is indicated by arrow.

Please change the paragraph appearing on page 9, lines 5-22 to read as follows:

Figure 4 shows another embodiment of the filter module 4. Between the draining layers 5a, 5b there are filter regions which include several filter layers 1a - 1d. These filter layers 1a - 1d have a degree of separation which rises when viewed in the flow direction, and for example the layer 1d can be a disinfection layer. The disinfection layer 1d is located directly in front of the draining layer 5b for the filtrate and has an especially high degree of separation. In this way the unfiltered material is filtered in stages and thus ensures an especially high service life of the filter module. The filter layers 1a - 1c in this embodiment, like the draining layer 5a which carries the unfiltered material, has filter elements 6 toward the filter space 3. Since the sealing elements of these layers adjoin one

another, an one-piece element in the form of a sealing tube can be used.

Since the disinfection layer 1d is that layer with the highest degree of separation, the unfiltered material flowing directly to the filtrate space 3 is adequately cleaned and therefore does not require a sealing element.

APPENDIX II**Marked-Up Version of Amended Claims Pursuant to 37 CFR §1.121(c)**

1. (Twice Amended) A filter [Filter] module which defines filtrate and unfiltered material spaces, and which comprises:

a plurality of [with layers of] filter [layers] regions formed of deep bed filter material, and

a plurality of draining layers which include a draining layer material disposed between adjacent ones of said filter regions, wherein [between which there are]

(i) a first type of said draining layers includes sealing [spacer] elements [of draining layers] disposed at a side thereof adjacent said unfiltered material space, and flow elements disposed at an opposite side thereof adjacent said filtrate space, and

(ii) a second type of said draining layers includes said sealing elements disposed at a side thereof adjacent said filtrate space, and said flow elements disposed at an opposite side thereof adjacent said unfiltered material space, wherein [the draining layers and the]

said filter [layers being] regions and said first and second types of draining layers are formed into a stack [stacked] on one another without gaps, such that said first and second types of [and the] draining layers alternate relative to one another in said stack so that said sealing elements thereof alternately seal the draining layers from said filtrate and unfiltered material spaces, and said flow elements alternately establish flow paths between said draining layers and said filtrate and unfiltered material spaces, respectively, and wherein

at least one of said [being sealed on alternate sides to the filtrate/unfiltered material space by means of sealing elements characterized in that the draining layers on the transition which is the other one at the time to the filtrate/unfiltered material space have flow elements, and that the] sealing elements [and/or the] and flow elements [have means for] include connectors for establishing mutual connection between the filter regions and the draining layers in the stack.

2. (Twice Amended) Filter module as claimed in claim 1, wherein [at least two] said filter [layers] regions include first and second filter layers having respective [with] different degrees of separation disposed one [lie] on top of [one] another.

3. (Twice Amended) Filter module as claimed in claim 1, wherein [at least two] said filter [layers] regions include first and second filter layers having [with] the same degree of separation disposed one [lie] on top of [one] another.

4. (Twice Amended) Filter module as claimed in claim 1, wherein the filter [layers] regions are formed of an absorptive filter material [adsorptively acting filter layers].

5. (Twice Amended) Filter module as claimed in claim 1, wherein the filter regions include filter materials having different absorption properties [differently adsorptively acting materials are worked into the filter layers].

Please cancel claim 6.

9. (Twice Amended) Filter module as claimed in claim 1, wherein the connectors [sealing elements on their end faces have structures which fit] protrude from said sealing elements into said adjacent one of said filter regions [the layer which is adjacent at the time].

11. (Twice Amended) Filter module as claimed in claim 1, wherein the draining [layers include has] layer material includes a plastic nonwoven material.

12. (Twice Amended) Filter module as claimed in claim 1, wherein the draining layer material is [made in one piece] integral with the sealing and flow elements thereof [element and the flow element].

13. (Twice Amended) Filter module as claimed in claim 1, wherein [these] said sealing elements include interconnected projections and [connection means are] clips [and catch projections].

14. (Amended) Filter module as claimed in claim 1, wherein the filter and draining layers [and the draining layers] are planar structures.